

CLAIMS

What is claimed is:

1. A tissue excision system for percutaneous surgery, comprising:
 - a cannula comprising a tissue-penetrating member having a distal end defining an aperture on one side thereof;
 - an occluding member slidably received on or in said cannula and closing said aperture when said occluding member is adjacent said cannula distal end;
 - means for engaging adjacent tissue via said aperture; and
 - cutting means for resecting a section of said engaged tissue.
2. The percutaneous tissue excision system of claim 1 wherein said engaging means comprises a tissue-engaging needle having a shaft and distal and proximal ends, and wherein said tissue-engaging needle is adapted for insertion through said cannula, said tissue-engaging needle comprising at least one barb extending outwardly from said shaft.
3. The percutaneous tissue excision system of claim 1 wherein said engaging means is reciprocally received in said cannula.
4. The percutaneous tissue excision system of claim 1 wherein said engaging means is rotatably received in said cannula.
5. The percutaneous tissue excision system of claim 1 wherein said engaging means is constructed such that it has a normal configuration that is retained by said occluding member when said occluding member is adjacent said cannula distal end and extends through said aperture when said occluding member is removed from said aperture.
6. The percutaneous tissue excision system of claim 1, further including means for retrieving said resected tissue from said distal tool end and a tissue-removal system for removing tissue from said retrieving means.
7. The percutaneous tissue excision system of claim 6 wherein said tissue-removal system comprises a keyhole slot.
8. The percutaneous tissue excision system of claim 1 wherein the first tissue-engaging device comprises a hook.
9. The percutaneous tissue excision system of claim 17 wherein said hook comprises a length of wire that has been bent through at least about 270°.
10. The percutaneous tissue excision system of claim 1 wherein said engaging means comprises an elongate body housed within said cannula and comprising two radially extendable

arms constructed such that radially extending said arms causes them to open and extend outwardly through said side aperture and retracting said arms causes them to close.

11. The device according to claim 10 wherein said arms each include an opposing edge and at least one opposing edge includes teeth or ridges.
12. The device according to claim 10 wherein said opposing edges comprise cutting blades.
13. The device according to claim 10, further including a outer cutting element slidably mounted on said cannula.
14. The device according to claim 10, further including a retractable tissue-engaging device received within said elongate body.
15. The device according to claim 14 wherein said tissue-engaging device can be extended to the distal end of the cannula to engage a tissue sample, retracted for removal of the tissue sample, and re-extended into the cannula.
16. The device according to claim 14, further including means for removing tissue from the tissue-engaging device.
17. A method for treating stenosis in a spine, the spine including a thecal sac and a canal and an epidural space therebetween, the stenosis determining a region of interest in the spine, comprising the steps of:
 - a) percutaneously accessing the epidural space in the region of interest;
 - b) compressing the thecal sac in the region of interest by injecting a fluid to form a safety zone and establish a working zone, the safety zone lying between the working zone and the thecal sac;
 - c) inserting a tissue removal tool into tissue in the working zone;
 - d) using the tool to percutaneously reduce the stenosis; and
 - e) utilizing imaging to visualize the position of the tool during at least a part of step d).
18. The method of claim 17 wherein the tool comprises:
 - a cannula comprising a tissue-penetrating member having a distal end defining an aperture on one side thereof;
 - an occluding member slidably received on or in said cannula and closing said aperture when said occluding member is adjacent said cannula distal end;
 - means for engaging adjacent tissue via said aperture; and
 - cutting means for resecting a section of said engaged tissue.
19. The method of claim 18 wherein the tool further includes means for retrieving said resected tissue from said distal tool end and a tissue-removal system for removing tissue from said retrieving means.

20. The method of claim 17 wherein step d) comprises
 - d1) engaging a tissue sample in the working zone;
 - d2) excising the tissue sample;
 - d3) removing the tissue sample from the working zone; and
 - d4) repeating steps d1) through d3) until a desired amount of tissue has been removed.
21. The method of claim 20 wherein the tissue sample comprises tissue selected from the group consisting of the ligamentum flavum, fat, and bone.
22. The method of claim 20 wherein step d) is carried out without repositioning the device in the tissue.
23. The method of claim 20 wherein step d) comprises
 - di) providing an anchor having first and second tissue-engaging ends;
 - dii) engaging the ligamentum flavum with said first tissue-engaging end;
 - diii) using said engaged first end to pull at least a portion of the ligamentum flavum into a desired position; and
 - div) using said second tissue-engaging end to anchor said anchor such that said ligamentum flavum is retained in a desired position.
24. The method of claim 23 wherein step div) comprises anchoring said anchor to paraspinous tissue.
25. The method of claim 23 wherein step div) comprises anchoring said anchor to bone.
26. The method of claim 23 wherein the injected fluid includes a contrast medium.
27. The method of claim 23 wherein the injected fluid has a temperature-dependent viscosity and is more viscous at 37°C than at 30°C.
28. A kit for performing a procedure on a spine, the spine including an epidural space containing a thecal sac, the kit comprising:
 - an insertion member for accessing the epidural space;
 - an expandable device adapted to be inserted into the epidural space by the insertion member and expanded so as to compress a portion of the thecal sac and provide a safety zone within the epidural space.
29. The kit according to claim 28 wherein said expandable device comprises a volume of a contrast medium.
30. The kit according to claim 29 wherein the contrast medium comprises a radio-opaque non-ionic myelographic contrast medium.
31. The kit according to claim 28 wherein said expandable device comprises a volume of a medium that is injectable at ambient temperatures and more viscous at body temperature.

32. The method according to claim 28 wherein the contrast medium includes a bioactive agent.
33. The method according to claim 28 wherein the contrast medium includes a steroid.
34. The kit according to claim 28, further including a surgical device.
35. The kit according to claim 34 wherein said surgical device comprises:
a cannulated scalpel having a side aperture proximal its distal end;
an elongate body housed within said cannulated scalpel and comprising two radially extendable arms constructed such that radially extending said arms causes them to extend outward through said side aperture and retracting said arms causes them to close.
36. The kit according to claim 34 wherein said surgical device comprises a tool including means for engaging the ligamentum flavum and means for resecting a section of the ligamentum flavum.
37. The kit according to claim 34 wherein said surgical device comprises:
a cannula a side aperture proximal its distal end;
a barbed member coaxially received within said cannula; and
a cutting member received on said cannula.
38. The kit according to claim 34 wherein said surgical device includes means for engaging a first anatomical structure and means for affixing said first anatomical structure to a second anatomical structure.
39. The kit according to claim 34 wherein said surgical device includes means for engaging and retracting the ligamentum flavum and means for anchoring the retracted ligamentum flavum.